Abstract of the Disclosure

An open magnetic structure comprising a conical magnetic structure that generates an NMR imaging field around the head of a patient, and a transition magnetic structure including a cylindrical magnet connected to the conical magnetic structures that extends the uniform field generated in the head magnet cavity to or near the shoulders of the patient. The overall geometry is designed to integrate the magnetic structure in a surgical suite with a minimum interference with surgical procedures, which typically involve surgery on the brain of the patient. A method for improving field uniformity by shimming is also included. Advantages include improved field uniformity, and reduced weight and size.